

WHAT IS CLAIMED IS:

1. Data handling apparatus for handling data frames which are each associated with one of a plurality of priorities, the apparatus comprising:

5           a bridge having a plurality of bridge ports, a first one of the bridge ports having a plurality of service interfaces, each of the service interfaces capable of being associated with a channel in a connection-based network;

10           a map associated with the first one of the bridge ports, the map providing a correspondence between each of the plurality of priorities and one of the service interfaces;

15           a forwarding system configured to read a priority of a data frame to be forwarded onto the connection-based network by way of the first one of the ports, identify a service interface which the map indicates corresponds to the read user priority and forward the data frame over a channel in the connection-based network associated with the identified service interface.

2. The apparatus of claim 1 wherein the map comprises a lookup table.

3. The apparatus of claim 1 each of the service interfaces is associated with a channel identified by a predetermined connection identifier.

- 25 4. The apparatus of claim 3 wherein the connection-based network comprises an ATM network, channels in the connection-based

network are each identified by a connection identifier comprising a VPI and a VCI and each of the service interfaces associated with the first one of the bridge ports is associated with a channel having the same predetermined VPI.

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5. The apparatus of claim 4 wherein each of the service interfaces associated with the first one of the bridge ports is associated with a channel having a predetermined VCI and the VCI associated with each of the service interfaces associated with the first one of the bridge ports is different from the VCI associated with other ones of the service interfaces associated with the first one of the bridge ports.

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6. The apparatus of claim 4 wherein a plurality of the bridge ports each have a plurality of associated service interfaces, the service interfaces associated with each one of the bridge ports are all associated with channels having the same predetermined VPI and the service interfaces associated with different ones of the plurality of bridge ports are associated with channels having different predetermined VPIs.

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7. The apparatus of claim 1 comprising a mechanism configured to identify a service interface by way of which a data frame is received at the first one of the bridge ports from the connection-based network, assign a priority to the data frame based upon the correspondence provided by the map and tag the data frame with the assigned priority.

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8. The apparatus of claim 1 comprising a scheme comprising a plurality of maps, each of the plurality of maps applicable to a different number of available channels wherein the forwarding system is configured to determine a number of available channels associated with the first bridge port and to select one of the plurality of maps in the scheme based upon the number of available channels.

9. The apparatus of claim 8 wherein the maps in the scheme provide mappings such that when the number of available channels is increased by adding a new available channel, the forwarding system selects a next one of the plurality of maps which requires rerouting only of frames having priorities corresponding to the new available channel.

10. The apparatus of claim 9 wherein the plurality of maps specify the correspondences between priorities and channels set out in Table I.

11. A bridge for connecting a segment of a LAN to a connection-based network, the bridge comprising:

a plurality of bridge ports;

means for reading priorities of data frames directed by the bridge to at least a first one of the bridge ports;

a plurality of service interfaces associated with the first one of the bridge ports, each of the service interfaces capable of being associated with a channel in a connection-based network;

means for determining a number of the service interfaces associated with active channels in the connection-based network;

means for establishing a mapping between user priorities read by the means for reading priorities of data frames and the service interfaces associated with active channels in the connection-based network based at least in part on a number of the service interfaces associated with active channels in the connection-based network; and,

means for assigning frames to the service interfaces based upon the user priorities and the mapping.

12. The bridge of claim 11 wherein the connection-based network comprises an ATM network and the first one of the bridge ports is associated with a predetermined VPI.

13. The bridge of claim 12 wherein each of the service interfaces is associated with a predetermined VCI.

14. The bridge of claim 11 wherein the means for reading user priorities reads a three bit field in frames tagged with user priorities.

15. The bridge of claim 11 wherein the means for assigning frames received at the bridge port to the output ports operates according to Table I.

16. A method for directing frames between segments of a VLAN over a connection-based network, the method comprising:

receiving at a first bridge port connected to a first segment of a VLAN a frame addressed to a node on a second segment of the VLAN;

forwarding the frame to a second bridge port associated with a second segment of the VLAN and determining a user priority of the frame;

based on the user priority, assigning the frame to one of a plurality of service interfaces associated with the second bridge port, each of the service interfaces capable of delivering data to the second segment of the VLAN by way of a corresponding channel in a connection-based network.

17. The method of claim 16 comprising, before assigning the frames to one of the plurality of service interfaces, dropping any frames addressed to nodes on the first segment.

18. The method of claim 17 comprising, dropping the frames addressed to nodes on the first segment before reading the user priorities of the frames.

19. The method of claim 16 comprising identifying a set of the service interfaces which correspond to available channels wherein assigning each of the frames to one of a plurality of output ports comprises selecting a mapping based upon the number of available channels and assigning the frames to service interfaces of the set

of service interfaces which correspond to available channels according to the mapping.

5     20.    The method of claim 19 comprising assigning each of the frames to one of a plurality of service interfaces according to Table I.

10     21.    The method of claim 19 comprising, while a current mapping is in effect, determining that a next channel has become available and switching to a next mapping, wherein the next mapping differs from the current mapping only in that one or more priorities are associated with the next channel.

15     22.    The method of claim 19 comprising, upon failure of a channel associated with one of the service interfaces, adjusting the mapping by remapping one or more priorities associated with the one of the service interfaces to one or more other ones of the service interfaces.

20     23.    The method of claim 22 wherein adjusting the mapping comprises bumping frames of each priority assigned to the failed channel to a channel associated with a next lower priority.

25     24.    The method of claim 22 wherein adjusting the mapping comprises bumping frames of each priority assigned to the failed channel a channel associated with a lowest priority for which a channel remains available.

25. The method of claim 19 comprising upon failure of a channel associated with one of the service interfaces dropping frames having priorities associated with the one of the service interfaces.

5 26. The method of claim 19 comprising identifying a service interface by way of which a frame is received at one of the bridge ports from the connection-based network, assigning a priority to the data frame based upon the correspondence provided by the map and tagging the data frame with the assigned priority.

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27. The method of claim 25 wherein the map associates a plurality of priorities with the identified and the method comprises tagging the frame with a lowest one of the plurality of priorities.

15 28. A VLAN comprising a plurality of segments each bridged to a connection-based network by an apparatus according to claim 1, the VLAN comprising:

a first apparatus bridging a first segment to the connection based network; and

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a second apparatus bridging a second segment to the connection based network;

the first and second apparatus interconnected by a plurality of channels in the connection-based network each of the channels having a first end point at one of the service interfaces in the first apparatus and a second end point at one of the service interfaces in the second apparatus.

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